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P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
VICTORIA, NARCISO F	

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2438	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/572,621	VAN DER VEEN ET AL.	
	Examiner	Art Unit	
	NARCISO VICTORIA	2438	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the Application filed March 17, 2006.

2. Claims 1-30 have been examined and are pending.

Specification

3. The abstract of the disclosure provided by the Applicant is a copy of the front page of WO 2005/029466 document which is not in conformance with the requirement of 37 CFR 1.72(b). An abstract on a separate sheet is required.

Claim Objections

4. Claims 4-8, 18, 23 and 27-30 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot refer back to another multiple dependent claim. For example, claim 4 is a multiple dependent claim that depends on claim 3 which is also a multiple dependent claim. Claims 5-8 refer back to the improperly formatted claim 4 and thus inherit the same discrepancy. The same unacceptable multiple claim wording is found on claims 18, 23 and 17-30. See MPEP § 608.01(n). Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Lemma et al. ("A Temporal Domain Audio Watermarking Technique", a paper appeared in IEEE Transactions on Signal Processing, Vol. 51, No. 4, April 2003, pages 1088-1097; hereinafter Lemma).

As per claim 1, Lemma discloses a method for embedding watermarks (**Page 1088, Abstract, line 1: audio watermarking techniques**) in a digital host signal carrying signal information, the method comprising the steps of:

generating a watermark sequence of length Lw/N bits carrying predetermined information (**Page 1089, right column, equation (5): watermark sequence Lw/N can be derived from equation (5), where N=2**);

up-sampling the watermark sequence by a factor of N (**Page 1089, left column, last paragraph: up-sampling factor Ts is analogous to factor N**);

at the intermediate sampling points of the up-sampled sequence inserting a modified version of the watermark sequence to form a compound watermark sequence of length Lw (**Page 1089, right column, equation (5): watermark sequence of length Lw can be derived from given formula**); and

combining the compound watermark sequence with the host signal to watermark the host signal (**Page 1089, right column, Figure 1: watermark embedder producing y[n]**).

As per claim 2, Lemma discloses the method of claim 1, wherein N is 2 (**Page 1089, right column, equation (5): as in Lw/2, where N=2).**

As per claim 3, Lemma discloses the method of claim 1 or 2, wherein the modified versions of the watermark sequence are arranged such that the compound watermark sequence is bi-polar (**Page 1090, left column, Figures 3 and 4: as in Biphase shaping window function**).

As per claim 4, Lemma discloses the method of claim 1, 2 or 3, wherein the modification for generating the modified versions is chosen such that the DC component of the compound watermark sequence is reduced or minimized (**Page 1089, right column, Figure 2: as a function of the conditioning circuit**).

As per claim 5, Lemma discloses the method of any preceding claim, wherein inserting the modified version of the watermark sequence comprises inserting a negative version of the said watermark sequence at intermediate sampling points so as to form a bipolar up-sampled sequence (**Page 1090, left column, Figures 3 and 4: as in Biphase shaping window function**).

As per claim 6, Lemma discloses the method of any of the preceding claims, wherein inserting the modified versions comprises, for each intermediate point of the up-sampled watermark sequence, inserting a negative version of a neighbouring

sampled value of the watermark sequence (**Page 1090, left column, Figure 3: using Biphase shaping window function**).

As per claim 7, Lemma discloses the method of any preceding claim, wherein the method for embedding of a watermark in the sequence comprises a transform domain coefficients modulating method (**Page 1089, right column, Figures 1 and 2: as a function of the watermark conditioning circuit**).

As per claim 8, Lemma discloses method as in claim 7, where the transform is FFT (**Page 1088, right column, first paragraph: FFT transforms are addressed in the disclosure**).

As per claim 9, Lemma discloses a watermark decoding method comprising the steps of:

receiving a watermarked host signal (**Page 1091, right column, 4th paragraph: incoming watermarked signal**);

detecting a compound watermark sequence within the watermarked host signal (**Page 1091, right column, 4th paragraph: generating estimate of watermark sequence from incoming watermarked signal**);

splitting the compound watermark sequence into at least two groups of sample values corresponding to a watermark sequence and a modified version of the

watermark sequence (**Page 1093, left column, 2nd paragraph – 3rd paragraph: watermarked sequence is estimated to correspond to wd1[k] and wd2[k]**); and

performing inverse modification of the watermarked sequence in order to retrieve predetermined information carried by it (**Page 1093, left column, 3rd paragraph: payload is computed using relations given in equation (5) and equation (6)**).

As per claim 10, Lemma discloses the method of claim 9, wherein detecting the compound watermark sequence within the watermarked host signal comprises computing absolute values of received transform domain coefficients and performing a smoothing operation on them (**Page 1094, left column, 1st paragraph: averaging process is referred to as smoothing**).

As per claim 11, Lemma discloses the method of claim 10, wherein the smoothing operation comprises averaging the computed absolute values to form an averaged transform domain signal (**Page 1094, left column, 1st paragraph: averaging process is referred to as smoothing**).

As per claim 12, Lemma discloses the method of any of claims 9 to 11, wherein the compound watermark sequence comprises transform domain coefficients and the step of splitting comprises splitting the transform domain coefficients to assemble a first sequence comprising information at odd sampling points within the compound

watermark sequence, and a second sequence comprising information at even sampling points within the compound watermark sequence (**Page 1093, left column, 3rd paragraph: the process of splitting watermark sequence into wd1[k] and wd2[k]**).

As per claim 13, Lemma discloses the method of claim 9, wherein the step of splitting comprises applying the averaged transform domain signal to first and second signal paths, each signal path comprising a factor 2 down sampler and one signal path being delayed with respect to the other so as to split the averaged transform domain signal into the first and second sequences (**Page 1093, right column, Figure 10**).

As per claim 14, Lemma discloses the method of claim 9, wherein performing the inverse modification of the watermark sequence comprises taking the difference between the corresponding sample values of the first and second sequence and normalizing with respect to the sum of corresponding sample values of the first and second sequence (**Page 1093, right column: see equation (19)**).

As per claim 15, Lemma discloses a watermarked host signal, wherein the watermark comprises a compound watermark comprising a combination of an up-sampled sequence of a watermark and a modified version of the same watermark (**Page 1089, right column, Figure 1, element y[n] is a watermarked host signal**).

As per claim 16, Lemma discloses the watermarked host signal of claim 15, wherein the modification is chosen so as to reduce or minimise a DC component of the compound watermark (**Page 1089, right column, Figure 2: as a result of watermark conditioning**).

As per claim 17, Lemma discloses the watermarked host signal of claim 15 or 16, wherein the compound watermark is generated by up-sampling the watermark and inserting the modified version of the watermark at the intermediate sampling points generated by the up-sampling **(Page 1089, left column, last paragraph: up-sampler using factor Ts**).

As per claim 18, Lemma discloses the watermarked host signal of claim 15, 16 or 17, wherein where an up-sampling factor is chosen to be 2, the modified version comprises the inverse of the watermark **(Page 1089, right column, equation (5): Lw/2 where N=2**).

As per claim 19, Lemma discloses an apparatus for embedding watermarks in a digital host signal carrying signal information (**Page 1089, right column, Figure 1: watermark embedder**), the apparatus comprising:

a watermark sequence generator (110) for generating a watermark sequence, an up-sampler (120) for up-sampling the watermark sequence by a factor of N (**Page 1089, right column, Figure 2: watermark conditioning circuit**);

means for generating a compound watermark sequence by inserting a modified version of the watermark sequence into intermediate sampling points created by the up-sampling process (**Page 1089, right column, Figure 2: watermark conditioning circuit**); and

an embedder (140) for applying the compound watermark signal to a host signal (**Page 1089, right column, Figure 1: watermark embedder**).

As per claim 20, Lemma discloses the apparatus of claim 19, wherein the modification is chosen so as to reduce or minimise a DC component of the compound watermark (**Page 1089, right column, Figure 2**).

As per claim 21, Lemma discloses the apparatus of claim 19 or 20, wherein the up-sampler comprises a two times up-sampler (**Page 1089, left column, last paragraph: up-sampler using factor Ts**).

As per claim 22, Lemma discloses the apparatus of claim 20, wherein the means for forming a compound watermark comprises an FIR filter with a response B[m]=[-1,1] (**Page 1089; left column, second paragraph: H filter extracting part of the audio signal suitable for carrying watermark information**).

As per claim 23, Lemma discloses the apparatus of claim 19, 20, 21 or 22, wherein the watermark sequence comprises an FFT block (**Page 1088, right column, first paragraph: FFT transforms are addressed in the disclosure**).

As per claim 24, Lemma discloses a watermark decoding apparatus (**Page 1093, right column, Figure 10: watermark detector**), the apparatus comprising:

means for receiving a watermarked host signal (**Page 1093, right column, Figure 10: watermark detector receiving y'[n]**);

means for detecting a compound watermark sequence within the watermarked host signal (**Page 1093, right column, Figure 10: watermark detector extraction stage**);

means for splitting the compound watermark sequence into at least first and second sequences corresponding to a watermark sequence and a modified version of the watermark sequence (**Page 1093, right column, Figure 10: buffering and interpolation stage**); and

inverse modification means for performing an inverse modification of the watermark sequence in order to retrieve predetermined information carried by it (**Page 1093, left column, 3rd paragraph: watermark detector computing payload using equations (5) and (6)**).

As per claim 25, Lemma discloses the apparatus of claim 24, wherein the means for detecting a compound watermark sequence within the watermarked host signal

comprises a filter (210) for separating out FFT coefficients of the compound watermark sequence from a received watermarked host signal (**Page 1093, right column, Figure 10: watermark detector**).

As per claim 26, Lemma discloses the apparatus of claim 24 or 25, wherein the means for detecting the compound watermark sequence comprises absolute value computation means for providing absolute values of FFT coefficients (**Page 1093, right column, Figure 10: watermark detector**) .

As per claim 27, Lemma discloses the apparatus of claim 24, 25 or 26, wherein the means for detecting the compound watermark sequence comprises smoothing means for averaging the computed absolute values (**Page 1094, left column, 1st paragraph: averaging process which is referred to as smoothing**).

As per claim 28, Lemma discloses the apparatus of claim 27, wherein the smoothing means comprises an accumulator (220) (**Page 1094, left column, 1st paragraph: smoothing factor sr**).

As per claim 29, Lemma discloses the apparatus of any of claims 24 to 28, wherein the means for splitting the compound watermark sequence comprise first and second signal processing means, the first signal processing means being provided in a first signal path and the second signal processing means being provided in a second

signal path, each signal processing means comprising a down-sampler (240,250) of factor N and one of the first or second signal processing means further comprising delay means (230) so as to split the averaged transform domain signal into the first and second sequences (**Page 1093, right column, Figure 10: watermark sequence framings corresponding to $w_{d1}[k]$ and $w_{d2}[k]$**).

As per claim 30, Lemma discloses the apparatus of any of claims 24 to 29, wherein the means for performing the inverse modification of the watermark sequence comprises modification means arranged to take the difference between corresponding sample values of the first and second sequence and normalise with respect to the sum of corresponding sample values of the first and second sequence (**Page 1093, right column: see equation (19) for computing $w_i[k]$**).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Moskowitz et al. (US 5,905,800) - this reference discloses method and system for digital watermarking.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NARCISO VICTORIA whose telephone number is (571)270-7904. The examiner can normally be reached on Monday to Friday 8:00am - 4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Taghi Arani can be reached on (571)272-3787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NV/
/Taghi T. Arani/
Supervisory Patent Examiner, Art Unit 2438